

PA Chesapeake Bay Meaningful Watershed Educational Experience 2009 Grant Program for Conservation District – School Partnerships

Funding provided through the Federal NOAA B-WET Program

Project Update: January 1, 2009 – June 30, 2009

16 Pennsylvania Conservation Districts are partnering with 23 schools to carry out Meaningful Watershed Educational Experience grants. In addition to classroom learning that is guided by the Pennsylvania Department of Education's Environment and Ecology Standards, the awarded projects include hands-on experiences such as the following:

- Field-trips to Stroud Water Research Center, Levitz Park, Envirothon®, Quittapahilla Wetland Preserve, Prince Gallitzin State Park, Chesapeake Bay Foundation's Karen Noonan Environmental Center, Bear Creek Lake and others.
- Observing nearby streams, wetlands, and other aquatic areas for the impacts of human existence; learning about the functions of a wetland within a watershed and its characteristics (including plants, soil, water, and animal life); performing chemical, physical, and biological assessments; and participating in habitat restoration.
- Researching environmental concerns with abandoned mines and mine drainage. Visiting AMD sites and evaluating effects of acid mine drainage on local watersheds.
- Creation, restoration and preservation of school ponds, wetlands and streams to allow for future study experiences and outdoor learning environments.
- Designing and delivering school-based watershed festivals.
- Conducting field assessments to identify causes of stream impairment and developing team solutions that will lead to removal of streams from the 303(d) list. Through community outreach, facilitating best management practices to improve land use and water quality.

Three projects were completed during this period (final reports start on page 2)

- Quittapahilla Field Experience – Lebanon Conservation District partnered with Cornwall-Lebanon Schools
- Environmental Ed Field Trips – Lebanon Conservation District partnered with Palmyra Schools
- Wetland Creation Project – Luzerne Conservation District partnered with Wyoming Valley West Schools

Twenty projects are in progress and are due to be completed by 4/30/2010 (summaries start on page 5)



Final Reports for Completed Projects:

Project Title: Quittapahilla Field Experience

Funding: \$1500

Conservation District: Lebanon

School District: Cornwall-Lebanon

Summary: Students spent a day at the Quittapahilla Educational Wetland Preserve. They learned about the functions of a wetland within a watershed and its characteristics, including plants, soil, water, and animal life.

Students:

How many students in which grades were targeted through this project? 65 fifth graders

What percentage of each grade's total student body do these numbers represent? 95% of the entire grade at Union Canal (a few students stayed behind due to behavioral problems).

Project Overview:

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

All 5 stations directly related to either our local rivers/streams, stewardship &/or our impact on the Bay. The **Recycling** station reviewed the amount of trash we accumulate and where it goes – from the landfill to the watershed. Students picked up trash around the preserve & brought it to the Recycle station. The impact of trash was discussed, as was the need/importance for recycling. The **Macro Hunt** discussed our place in the watershed – at the headwaters of the Quittapahilla Creek & how the creek flows into the Swatara Creek, into the Susquehanna River & into the Bay. Then they looked for critters, identified them, and discussed reasons for the low numbers of critters found, including pollution problems. The **Plant/Planting** station discussed the importance of cattails and their ability to filter water & absorb toxins and clean our waterways. The students looked at the cross-section of the plant as we discussed the adaptations of the stem and the 6 plant parts. The students then planted 6 species of wetland plants & as we explained our goal to increase plant diversity in order to 1) clean the water and 2) increase wildlife diversity. **Waterfowl of the Wetlands** highlighted common birds found in wetlands. Numerous mounts were on display for the students to observe. Gerry Boltz discuss some benefits of wetlands, emphasizing habitat/nursery and a less on flood control and filtering. He had numerous handouts and posters for the teachers and students. The **Soils** station focused on the types of soils found in the wetlands and the functions they perform. Anaerobic and aerobic soils were observed, as well as the various colorings from deposits of minerals. Students used microscopes to look for microorganisms in the aerobic soils, and a link was made to pollution/oxygen levels/species found.

2. **2a.**Please describe the project's pre and post classroom activities/evaluations:

Prior to the wetland trip, the students reviewed the water cycle, its role within a wetland setting. They discussed the impacts of pollution on the watershed. The bodies of water in our local watershed were named, and the students observed a poster of possible pollution sources. Students brainstormed reasons why habitats must be preserved in our continually developing communities, and then predicted animal species they might observe at the wetland.

Post field trip, the students were asked to create a brochure with pictures and text showing the benefits of wetlands, and describing the various components they learned about (water, soil, plants, and animal species). The brochures were shared and discussed. They were then asked to write a short essay describing how one person can make a difference in protecting our watershed.

2b.In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?

Students gained insight into how the health of local streams (Quittapahilla) and rivers (Swatara and Susquehanna) contributes to the overall health of the watershed. They were made aware of the direct impact people and pollution have on the watershed. The students learned the components and role of wetlands within the watershed and the importance of preserving them.

2c. How were the classroom activities integrated into the school's curriculum?

The classroom activities are part of the 4.1 standards in the science curriculum. The water cycle, soil structures, animals and habitats, and plants are all part of the school science curriculum. In fifth grade, the current unit is

energy production. As we continue in that area, the hydropower plants' impact on the watershed will be a focus. Erosion controls, fish elevators, and water quality monitoring will be discussed as ways we try to protect the watershed.

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

Yes! 3 Conservation District Staff (Steph/Leigh/Angie - Watershed Specialist, Forester/Naturalist, & Program Specialist); Audubon Society & retired MS teacher & Envirothon Advisor Gerry Boltz; HACC professor Candie Falger; retired teacher, Dian Beamesderfer; and Beryl Stoddard, 5th grade Science teacher of Union Canal. Leigh, Beryl and Candie all serve on the QEWP Committee.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

Yes – as noted above: Audubon Society, Harrisburg Area Community College, Elem. School, and Conservation District.

5. In what ways might it be possible to measure long-term outcomes of the project?

As these fifth graders move into our middle school setting, their knowledge of the watershed should hopefully carry over to the Environmental Science class room. It may be possible at some point to have them return as instructors or helpers for future field trips to the wetlands. Another measurable outcome will be the vegetative planting in the lower eastern pond where 450 wetland plants were planted. It is our hope that these plants will **thrive and reproduce and that we can use this planting as the establishment of our own "nursery" so we can** then transplant stock to other areas of the pond and to the upper pond. The vegetation of our ponds is extremely sparse and monoculture. Most of the plants are Tall Fescue or Cattails. We are hopeful that the increase in plant diversity will lead to an increase in wildlife diversity – both in insects, waterfowl, and mammals visiting or inhabiting the wetland.

Project Title: Environmental Ed Field Trips

Funding: \$1500

Conservation District: Lebanon

School District: Palmyra

Summary: The Lebanon County Conservation District partnered with the Palmyra Area School District to provide their students the opportunity to participate in hands-on environmental educational activities that address state science standards, thus enriching and deepening their understanding. The activities included field-trips to Stroud Water Research Center, Levitz Park, Envirothon, Quittapahella Wetland Preserve and others as well as providing guidance.

Students:

How many students in which grades were targeted through this project? 35 students 4-6; 225 students 7-8; 50 students 9-12

What percentage of each grade's total student body do these numbers represent?

4-6 grades – 17%; 7 grade 100%; 8th grade – 5%; 9-12 – 6%

Project Overview:

1. In what ways did the project include hands-on watershed activities that strengthen a student's connection with the PA portion of the Bay, their local rivers and streams, and instill a stewardship ethic?

Project enabled students to participate in Envirothon in which they learned about the use of resources in the CB Watershed & its affects on the Bay.

2. **2a. Please describe the project's pre and post classroom activities/evaluations:**

Students were assessed several times to validate learning experiences.

2b. In what ways did those activities expand a student's knowledge of the PA portion of the Chesapeake Bay watershed and its rivers and streams?

Students had the opportunity to take part in the CBF – SWEP program.

2c. How were the classroom activities integrated into the school's curriculum?

Using Stroud's Watershed Tour to instruct students on value of Watersheds.

3. Was the project led by knowledgeable teachers, educators, and/or organizations familiar with providing meaningful Chesapeake Bay watershed experiences? Please describe:

Yes, all educators were experienced to include – Gina Mason – previous hydrogeologist for PA DEP; Stroud Water Research Center Educators; Lebanon County Conservation District Forester; DEP & DCNR staff; and CBF educators.

4. Did the project involve the community or other partners that expand the influence of the project? If yes, please explain.

Partners include: LCCD; DEP; DCNR; Stroud Water Research Center; CBF

5. In what ways might it be possible to measure long-term outcomes of the project?

Continued participation in the Envirothon

Project Title: Wetland Creation

Funding: \$2000

Conservation District: Luzerne

School District: Wyoming Valley West

Summary: Incorporating a wetland area into our school's pond bettered our students' understanding of an aquatic ecosystem. Students learned about natural filtration through the plants that are in our newly constructed bog. As students learn about the parts of our pond, stream, and bog they also are taught about local streams, ponds, lakes, and rivers to gain an appreciation for the area in which they live. Students learned about watersheds in general and, specifically, the Chesapeake Bay watershed. A local water feature design company coordinated the development and installation of our design. They donated all of their labor for the installation of the feature. Students helped plant our bog area, giving them a true hands on experience in environment and ecology.

Students:

State Street School has a total pupil enrollment of 580 students. The grant reached all students within the building. The following is the breakdown of class enrollment.

K-97(16.7%); 1st-85(14.6%); 2nd-101(17.4%); 3rd-98(16.8%); 4th-105(18.1%); 5th-94(16.2%)

Project Overview:

Each classroom teacher has an allotted amount of time to teach science. With the implementation of the PSSA science test, teachers need to follow the science and technology, environment and ecology standards and assessment anchors. Lessons from the Harcourt textbook and the North American Water Gardens Society were used to help students understand the make-up of wetlands. The Harcourt textbooks come with a test bank to use as an evaluation tool at the end of each ecological section as it relates to our wetland project. As an introduction we used Activity 1 "What makes a pond a pond?" and Activity 2 "The role of Ponds". Students helped plants our bog area which gave them a true hands on experience in environment and ecology. As we conclude the 2008-2009 school year, we are asking teachers to review the ecological concepts taught during the school year and use our natural wetland area as a reference and a guide. Our yearly data on the PSSA science test will also help us evaluate how our science program is relation to other schools in the state. We can use this data as an assessment tool from the environment and ecology sections.

A local water feature design company coordinated the development and installation of our design. They donated all of there labor for the installation of the feature. They are extremely knowledgeable in this area and provided valuable information regarding how the wetland works to our educators. The community has enjoyed our work by the many positive comments from the neighbors of the school and parents that see the project as they enter the school.

We hope this will continue to be a long term project. It started last year with our pond and stream and thanks to this grant we added the bog area. We intend to expand this outdoor classroom in the future.

Projects in Progress:

Project Title: Make a Splash**Funding:** \$2000**Conservation District:** Bradford**School District:** Towanda & Wyalusing

The Bradford County Conservation District will host 2 "Make A Splash" (Aquatic Field Days) for Towanda Area Elementary School – 5th grade and Wyalusing Area Elementary School – 4th grade. The events will be held at the French Azilum Historic Site located on the banks of the Susquehanna River. A total of 224 students and 10 teachers will participate in the Field Days.

Project Title: Trout in the Classroom**Funding:** \$2460**Conservation District:** Bradford**School District:** Troy

Trout in the Classroom brings field experiences indoors. Additionally, outdoor field experiences (biological, physical, and chemical water quality analysis, and watershed-related instruction) take place in and along creeks and tributaries within walking distance from the participating school. Teachers and sponsors will facilitate the lessons and activities to 9th through 12th grade students who participate in activities linked to water testing, fisheries and nutrient management (via land use judging, Envirothon, Nutrient Management Planning Competition, Conservation Field Days, and classroom instruction).

Project Title: Contributory Systems of the Bay**Funding:** \$2500**Conservation District:** Cambria**School District:** Cambria Heights

Students will take a field trip to Prince Gallitzin State Park, where they will test and observe the streams, wetlands, and other aquatic areas for chemicals/bacteria/materials that were a product of human existence. Students will also study the aquatic habitats, examining plants and animals in the Park. Students will have the opportunity to visit the Seldom Seen Tourist Coal Mine. They will examine an array of resources including mining structures and original equipment, participating in an underground tour, which will enable them to fully understand the cause and effects of mining on the local watersheds. All students in the 6th grade will participate (98 students).

Project Title: Stream Monitoring**Funding:** \$2500**Conservation District:** Cameron**School District:** Cameron County

Sophomore, Junior and Senior Biology and Ecology students will explore the stream that runs adjacent to the school (Wheaton Hollow, tributary to the Driftwood Branch of the Sinnemahoning) and the students will perform leaf bag, kick-net and chemical monitoring as part of their Aquatics Ecology curriculum. The purchase of tests bottles, kick nets and monitoring kits, as well as educational materials, will enhance their understanding of the principles.

Project Title: Pond Habitat Study & Restoration**Funding:** \$2500**Conservation District:** Centre**School District:** Bald Eagle

The project will include the restoration of an existing pond (2/3 acre) that is located on the grounds of the Bald Eagle Area High School on route 220 in Wingate. In addition to the pond habitat restoration, we plan to purchase equipment that will be used by multiple grade levels for pond study experiences. For the fall of 2009, the district is targeting grade 4 students (160 students) and teachers (9) to implement the planned supplemental curriculum at the elementary level. The science committee has already created the lesson plans for grade 4 and they are now working on lesson plans for grades 1-6. It is hopeful that by the spring of 2010 that the rest of the elementary program (grades K,1,2,3,5 and 6 with approximately 800 more students) would be scheduled for the pond experiences. At the middle and high school levels, the environmental science classes and the Envirothon and Fishing Clubs will be targeted for implementation in the fall of 2009. The task force members from the high school will work with the building principals and the science department to transition more of the current science curriculum to the outdoor education site by the spring of 2010.

Project Title: Briar Creek Restoration & Festival**Funding:** \$2200**Conservation District:** Columbia**School District:** Berwick

Berwick Middle School students (grade 8) will participate field trips to study and appreciate the Briar Creek Watershed. They will accomplish a habitat restoration project at Briar Creek Lake. They will also design and deliver a watershed festival to Berwick elementary school.

Project Title: Fishing Creek BMPs for Stream Improvement**Funding:** \$2200**Conservation District:** Columbia**School District:** Central Columbia

Bloomsburg Christian School students (grades 6-12) will become intimately familiar with their schools' watershed-Fishing Creek (especially with streams listed by PA DEP on the 303(d) list of impaired waters). They will participate in field assessments to identify causes of impairment and they will work as a team to propose solutions that will lead to removal from the 303(d) list. Through community outreach, the students will facilitate 1-3 best management practices to improve land use and water quality. They will also provide a watershed fair to elementary students.

Project Title: Mud Run BMPs for Stream Improvement**Funding:** \$2200**Conservation District:** Columbia**School District:** Millville

Greenwood Friends School students (grades 5-8) will become intimately familiar with their schools' watershed-Mud Run (listed by PA DEP on the 303(d) list of impaired waters). They will participate in field assessments to identify causes of impairment and they will work as a team to propose solutions that will lead to removal from the 303(d) list. Through community outreach, the students will facilitate 1-3 best management practices to improve land use and water quality.

Project Title: Environmental Impacts Field Study**Funding:** \$2000**Conservation District:** Dauphin**School District:** Susquehanna

Londonderry School is committed to providing students with hands-on experiences to explore the natural environment. Science and environmental studies are integrated across class disciplines. Londonderry School strives to make students aware that they are part of an integral part of numerous ecosystems. For this project, Londonderry School proposes to immerse students in a field study to help them further understand their impacts on the environment. This field study would take place at the Chesapeake Bay Foundation's Karen Noonan Environmental Center. This program targets all of the 7th and 8th grade students.

Project Title: Watershed Festival**Funding:** \$1016**Conservation District:** Huntingdon**School District:** Huntingdon

Southside Elementary 5th grade students will participate in a watershed festival in their school. HCCD will teach stations designed to connect watersheds and land activities with stream health parameters such as aquatic insects and fish diversity. Specifically, stations will include identification of macroinvertebrates as indicators of water quality, native PA fish identification, and watershed influences on water quality using the Enviroscope model. Involves all 5th grade students.

Project Title: Watersheds, the Water Cycle, & Aquatic Life**Funding:** \$1860**Conservation District:** Lackawanna**School District:** Lakeland

Through classroom presentations and on-site field activities, fourth grade students will learn about watersheds, the water cycle, aquatic life, and acid mine drainage in Lackawanna County. The six-week Meaningful Watershed Experience program will include all fourth grade students. The watershed festival will also include all third grade students. For the field sessions, students will be transported to the Gravity Slope Outfall in Peckville, PA, an acid mine drainage site in the Lackawanna River. Here students will be able to see the orange, polluted water and learn about its connection to the coal industry and the ways it is treated. Students will then be taken to a healthier section of the river to make comparisons to the polluted area. Students will have the opportunity to conduct chemical tests and collect macroinvertebrates.

Project Title: Human Impacts on Watersheds**Funding:** \$1845**Conservation District:** Lancaster**School District:** Ephrata

Following classroom introduction activities, all students in third grade will have an opportunity to participate in a multi module in-the-field learning experience. The goal of the in-the-field learning experience will enable students to connect human impacts to the watersheds in which they live. Students will gain knowledge of concepts relating to both surface water and groundwater through in-the-field experiences such as stream, macroinvertebrate, aquifer and nature studies.

Project Title: Limestone Run Case Study**Funding:** \$2494**Conservation District:** Northumberland**School District:** Milton

The Meaningful Bay Experience/Habitat Restoration Project at Milton Area High School will focus on student achievement of the Pennsylvania Environment and Ecology Standards using Limestone Run as a case study and laboratory for hands-on learning, inquiry-based learning and problem-based learning. Students will participate in four days of water testing on the Limestone Run in which chemical, physical, and biological assessments will be performed. Also, students will attend a tour of the Stroud Water Research Center viewing a research facility dedicated to the study of streams and rivers, showing how water analysis studies and results can be used to promote a better understanding and thus improved use and care of this natural resource. Students in grades 11 and 12 will participate in this project.

Project Title: Outdoor Learning Lab Experience 1**Funding:** \$2500**Conservation District:** Snyder**School District:** Mid-West Middleburg

The Outdoor Educational Experience is a three day trip for Middleburg 5th grade students. The students will be introduced to a number of watershed experiences including stream studies, nonpoint source pollution education, macroinvertebrate/fish/reptile/amphibian identification and study, enviroscape and exploration of wooded areas and lakes. The project takes place at Camp Mt Luther and will include a visit from Freddy the Fish who travels downstream and is subject to all the pollutants he encounters.

Project Title: Outdoor Learning Lab Experience 2**Funding:** \$1946.75**Conservation District:** Snyder**School District:** Mid-West West Perry

The Outdoor Educational Experience is a three day trip for West Perry 5th grade students. The students will be introduced to a number of watershed experiences including stream studies, nonpoint source pollution education, macroinvertebrate/fish/reptile/amphibian identification and study, enviroscape and exploration of wooded areas and lakes. The project takes place at Camp Mt Luther and will include a visit from Freddy the Fish who travels downstream and is subject to all the pollutants he encounters.

Project Title: Outdoor Learning Lab Experience 3**Funding:** \$1946.75**Conservation District:** Snyder**School District:** Mid-West West Snyder

The Outdoor Educational Experience is a three day trip for West Snyder 5th grade students. The students will be introduced to a number of watershed experiences including stream studies, nonpoint source pollution education, macroinvertebrate/fish/reptile/amphibian identification and study, enviroscape and exploration of wooded areas and lakes. The project takes place at Camp Mt Luther and will include a visit from Freddy the Fish who travels downstream and is subject to all the pollutants he encounters.

Project Title: AMD Field Project**Funding:** \$1760**Conservation District:** Sullivan**School District:** Sullivan

The goal of this Meaningful Watershed Educational Experience project is to educate students about activities in their “backyard” that have an effect on the Chesapeake Bay. The project will be part of the 8th grade science class and add to the current studies of fresh water and fresh water needs, pollution and treatment. The current classroom studies on this topic include impacts to both surface and ground water and treatment of both to provide clean water. The MWEE will allow the studies to be taken into the field and students will have a hands-on learning experience to fresh water impacts and treatment practices that are actively making and environmental impact on the Loyalsock Creek.

Project Title: Stream Environment Field Experience**Funding:** \$1000**Conservation District:** Wyoming**School District:** Lackawanna Trail

All kindergarden students will experience the stream environment first hand which will supplement the classroom curriculum. Students will identify fish, frogs, insects and macro-invertebrates, and examine the organisms under a microscope and observe the environment they live in. They will also understand how the importance of water quality impacts the health of these organisms as well as the health of the Chesapeake Bay.

Project Title: Integrated Environmental Learning**Funding:** \$1650**Conservation District:** York**School District:** Central York

The project focuses on connecting watersheds, water resources and human interrelationships surrounding our new high school by students in Environmental Science. These areas will become part of an out-of-the-classroom integrated learning environment where students apply their knowledge in a real and tangible setting. Specifically, Environmental Science students at the new high school will visit six (6) local water resource management facilities in the Codorus Creek Watershed, including Lake Marburg Reservoir (DCNR & Glatfelter), Glatfelter Inc., Indian Rock Dam (U.S. Army Corps of Eng.), The York Water Company, City of York Flood Control Project, and Springettsbury Wastewater Treatment Plant, making it an extension of the classroom. 12th grade students in Environmental Studies will be targeted.

Project Title: Wetland Restoration and Preservation**Funding:** \$2499**Conservation District:** York**School District:** Spring Grove

Environmental Science students at the new high school will work to enhance the existing wetland environment, making it an extension of the classroom, available to all in the community. The project focus is restoration and preservation of wetland sites surrounding our school by 11th and 12th grade students.